

Work Order ID 58337

May 3, 2010 2:33:00 PM

Item ID: D4010-1

Revision ID:

Item Name: Bearpaw

Start Date: 5/03/10

Start Qty: 8.00

Required Date: 5/07/10

Req'd Qty: 8.00

Reference:

Approvals:

Process Plan:

Date:

QC:

Date:

Tooling:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D4010

100

0.00



Thermoform

HAND FINISHING THERMOFORMING

Memo

0.00

Thermoforming Machine

Cut Blanks to fit frame size

105

0.00



HandThermo

Dry Material

Memo

0.00

Hand Finishing Thermoforming

Dry Sheet as per QSI022 ALEXTRA

Temp: 240 F

Time IN: 8:00 PM 10/05/8

Time OUT: 7:00 AM 10/05/10

ENGINEERING
APPROVAL

RE-INSPECT PER
D4010 REV.D
10.06.03 Page 1

Accept



Setup Start



Stop



Cust Item ID:

Customer:



BB
10/05/06
(X8)

BB
10/05/10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 58337

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Page 2

Item ID: D4010-1

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Stop



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Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

110

0.00



THERMOFORMING MACHINE

Thermoform

Memo

0.00

Thermoforming Machine

Thermoform as per Dwg. D4010-1 and Folio FTA067 using tool DT 9540

Dwg. Rev. CFolio Rev. B

120

0.00



QC2- Inspect parts off machine FAI/FAIB

QC

Memo

0.00

Quality Control

Visually inspect for proper formation of each part

130

0.00



QC8- Inspect parts - second check

QC

Memo

0.00

Quality Control

BB
10/05/10
X8

BB
10/05/10
X8
Wh
10/05/10
X8

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 58337

May 3, 2010 2:33:01 PM



Page 3

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Item Name: Bearpaw

Start Date: 5/03/10

Start Qty: 8.00



Cust Item ID:

Required Date: 5/07/10

Req'd Qty: 8.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

140

0.00



HAND FINISHING THERMOFORMING

Thermoform

Memo

0.00

Thermoforming Machine

1-Trim & Drill to Finished Dimensions as per dwg D4010-1

2- Use wearplate jig DT9542 to transfer drill holes in bearpaw as per dwg and use 0.375" unibite to open holes to finish size.

3- Chamfer all holes on both sides using appropriate 0-flute countersink bit.

BB
10/05/11
X8

145

0.00



Anneal Material

HandThermo

Memo

0.00

Hand Finishing Thermoforming

Anneal trimmed & drilled product at 250 deg. F. for 75 minutes & allow to cool in oven.

Time In: 3:30 PM 10/05/11

Oven Off: 4:45 10/05/11

BB
10/05/11
X8

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Work Order ID 58337

May 3, 2010 2:33:01 PM



Item ID: D4010-1

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Setup Start



Revision ID:

Stop



Item Name: Bearpaw

Start Date: 5/03/10 Start Qty: 8.00



Cust Item ID:

Required Date: 5/07/10 Req'd Qty: 8.00

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150

QC2- Inspect parts off machine FAI/FAIB

0.00



QC

Memo

0.00

Quality Control

Check dimensions to ensure conformity to drawing tolerances.

160

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

was re inspected to Rev D Dwg

8/06/04

**ENGINEERING
APPROVAL**

RE-WPBT

PER D4010

REV. D.

10.06.03.

170

Identify as per dwg & Stock Location:

0.00



Packaging

Memo

0.00

Packaging

57919

(88)

P10 →

10/05/11
(X8)

W/O: 58337		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
10/05/12	#	Perm. Change move step # 100 (QC2) to after step # 140. makes no sense to have it after step # 145		10.06.07			S 10/05/12
		Update Day Rev to Rev D					S 10/05/12

Part No: D4010-1 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Work Order ID 58337

May 3, 2010 2:33:01 PM



Page 5

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Accept



Setup Start



Revision ID:

Stop



Item Name: Bearpaw

Start Date: 5/03/10

Start Qty: 8.00



Cust Item ID:

Required Date: 5/07/10

Req'd Qty: 8.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

10/06/07 *[Signature]*
MR
10-6-4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

May 3, 2010 2:32:58 PM

Page 1

Work Order ID: 58337



Parent Item: D4010-1



Parent Item Name: Bearpaw

Start Date: 5/03/10

Required Date: 5/07/10

Comments: IPP RevA: New issue DD verified by:EC
IPP Rev B. Improved process Add Step 105 (Drying) & 145 (Annealling) to
routings 10/03/31 DL

Start Qty: 8.00

Required Qty: 8.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Qty per Kit	Qty	Date	Status
M-ALXTRAB-S.300		Purchased	No			100	sf	488.9800	7.104			



Alextra ET 0 .300 sheet



Location

Loc Qty

Loc Code

therm

113108

488.98

488.98

8

BB
10/05/06

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: 58337
Description: BEARPAW	Part Number:
Inspection Dwg: D4010 Rev: C	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST
THERMOFORMING SECTION

Description	Accept	Reject	Method of Inspection	Comments
Inside Radii less than <u>N/A</u>	✓			
Shape Definition	✓			
Texture Retention	✓			
Material imperfections such as bumps, cracks, voids, scratching	✓			

Measured by: <u>Wh</u>	Date: <u>10/05/10</u>
-------------------------------	------------------------------

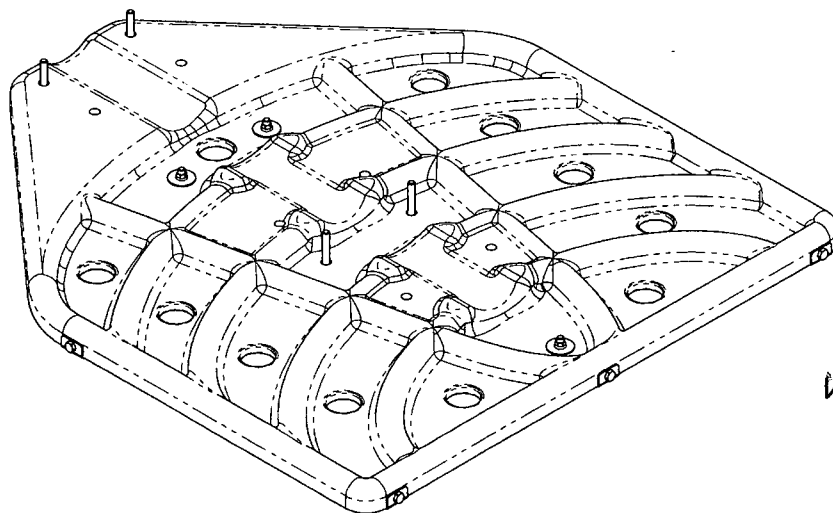
TRIMMING SECTION

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
12.00"	± 0.25"	11.875"	✓			
5.50"	± 0.30"	5.50"	✓			
9.50"	± 0.30"	9.50"	✓			
11.81"	± 0.30"	11.81"	✓			
16.69"	± 0.30"	16.70"	✓			
20.94"	± 0.30"	20.90"	✓			
23.25"	± 0.30"	23.25"	✓			
24.66"	± 0.25"	24.5"	✓			
2.34"	± 0.25"	2.25"	✓			
1.00"	± 0.100"	1.05"	✓			
Ø 1.25"	± 0.13"	1.35"	✓			
Ø 0.375"	± 0.001"	0.375"	✓			

Measured by: <u>Wh</u>	Date: <u>10/05/11</u>
Audited by: <u>JB</u>	Date: <u>10/05/11</u>
Preliminary Approval:	Date:

Rev	Date	Change	Revised by	Approved
B	10.04.14	Added preliminary approval	KJ	

10.04.14



D4010-041 BEARPAW ASSEMBLY (407)

RELEASED
2009-11-21
MB

REV.	DESCRIPTION	BY	DATE
C	OPTIMIZED DESIGN BASED ON FUNCTIONALITY AND TO EASE MANUFACTURING	MB	09.11.10
B	REDESIGNED; ADDED PROVISIONS FOR COMPATIBILITY WITH OEM SKIDTUBES/SADDLES; REDEFINED SOME TOLERANCE	MB	09.11.02
A	NEW ISSUE	MB	09.10.22
DESIGN	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA		
DRAWN	DRAWING NO. D4010		
CHECKED	REV. C		
MFG. APPR.	SHEET 1 OF 3		
APPROVED	TITLE BEARPAW (407)		
DE APPR.	SCALE NTS		
DATE	09.11.10		

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

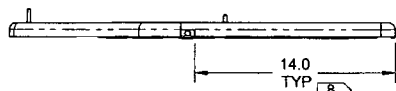
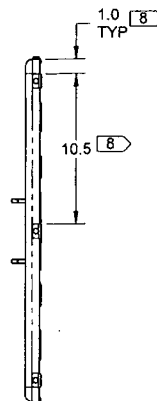
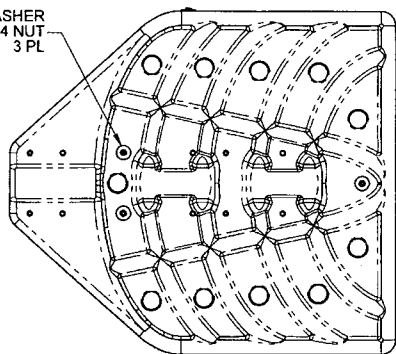
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

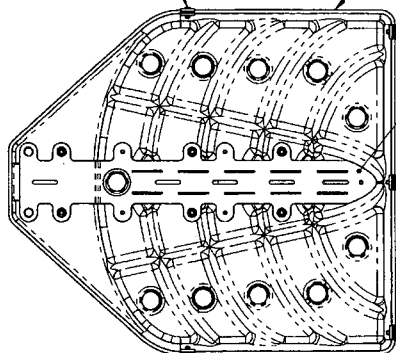
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

D3456-1 WASHER
MS21043-4 NUT
3 PL



8 AN3C5A BOLT
D4015-041 WEARBAR
MS21043-3 NUT



D4010-1
BEARPAW

AN3C5A BOLT 8
D4015-041 WEARBAR
MS21043-3 NUT

D4013-041 WEARPLATE
ASSEMBLY

AN3C5A BOLT 8
D4015-041 WEARBAR
MS21043-3 NUT

AN3C5A BOLT 8
D4015-041 WEARBAR
MS21043-3 NUT

8 AN3C5A BOLT
D4015-041 WEARBAR
MS21043-3 NUT

D4010-041 BEARPAW ASSEMBLY (407)

ITEM	QTY -041	P/N	DESCRIPTION
1	X	D4010-041	BEARPAW ASSEMBLY (407)
3	3	D3456-1	WASHER
4	1	D4010-1	BEARPAW
5	1	D4013-041	WEARPLATE ASSEMBLY
6	5	D4015-041	WEARBAR
21	5	AN3C5A	BOLT
22	5	MS21043-3	NUT
23	3	MS21043-4	NUT

ilo
58337

RELEASED
2009-11-24

D4010-041 NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 9.41 lbs
- 8) LOCATE D4015-041 (ITEM 5) AS SHOWN AND TRANSFER DRILL $\phi 0.191$ " HOLE FROM D4015-041 TO D4010-1 BEARPAW AND FASTEN USING PRESCRIBED HARDWARE.
- 9) TORQUE: AN3 NUTS = 15-20 in-lb
AN4 NUTS = 50-70 in-lb

DESIGN	14	DART AEROSPACE LTD	
DRAWN	8	HAWKESBURY, ONTARIO, CANADA	
CHECKED	15	DRAWING NO. D4010	REV. C
MFG. APPR.	15		SHEET 2 OF 3
APPROVED	15	TITLE BEARPAW (407)	SCALE NTS
DE APPR.	15		
DATE	09.11.10	<small>COPYRIGHT © 2009 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

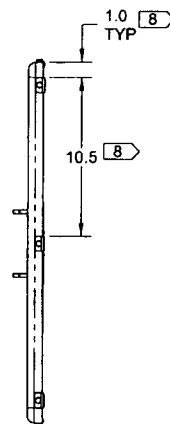
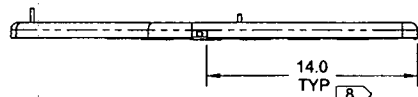
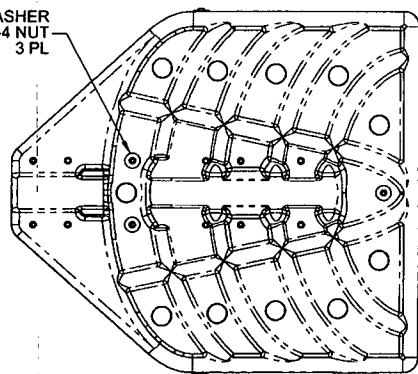
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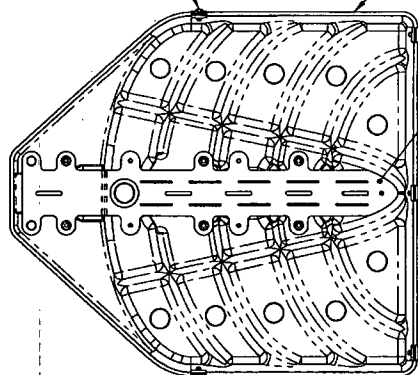
NOTE: Date & initial all entries

REFERENCE ONLY

D3456-1 WASHER
MS21043-4 NUT
3 PL



AN3C5A BOLT
D4015-041 WEARBAR
MS21043-3 NUT



AN3C5A BOLT
D4015-041 WEARBAR
MS21043-3 NUT

D4010-1
BEARPAW

AN3C5A BOLT
D4015-041 WEARBAR
MS21043-3 NUT

D4013-041 WEARPLATE
ASSEMBLY

AN3C5A BOLT
D4015-041 WEARBAR
MS21043-3 NUT

AN3C5A BOLT
D4015-041 WEARBAR
MS21043-3 NUT

D4010-041 BEARPAW ASSEMBLY (407)

ITEM	QTY -041	P/N	DESCRIPTION
1	X	D4010-041	BEARPAW ASSEMBLY (407)
2	3	D3456-1	WASHER
3	1	D4010-1	BEARPAW
4	1	D4013-041	WEARPLATE ASSEMBLY
5	5	D4015-041	WEARBAR
6	5	AN3C5A	BOLT
7	5	MS21043-3	NUT
8	3	MS21043-4	NUT

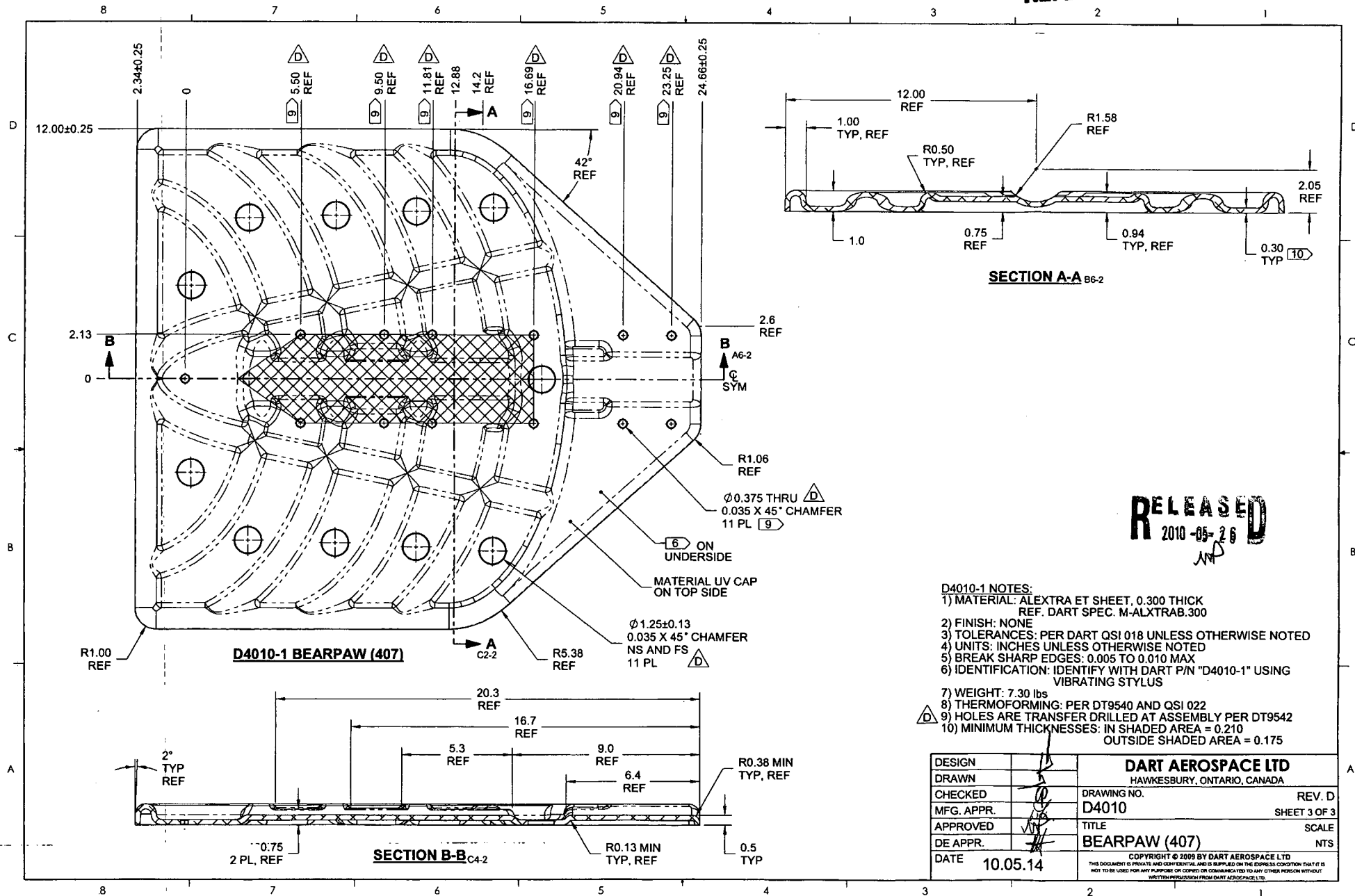
RELEASED
2010-05-28

D4010-041 NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 9.37 lbs
- 8) LOCATE D4015-041 (ITEM 5) AS SHOWN AND TRANSFER DRILL $\varnothing 0.191$ HOLE FROM D4015-041 TO D4010-1 BEARPAW AND FASTEN USING PRESCRIBED HARDWARE.
- 9) TORQUE: AN3 NUTS = 15-20 in-lb
AN4 NUTS = 50-70 in-lb

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. D
MFG. APPR.		D4010	SHEET 2 OF 3
APPROVED		TITLE	SCALE
DE APPR.		BEARPAW (407)	NTS
DATE	10.05.14	<small>COPYRIGHT © 2009 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD</small>	

REFERENCE ONLY



L Lacelle**From:** Marc Bellavance [mbellavance@dartaero.com]**Sent:** June 3, 2010 8:26 AM**To:** 'L Lacelle'; 'Mike Petsche'**Subject:** RE: 407 beapaws

Well, drawing D4010 Rev. D was revised and released on May 26 to include all the changes discussed during our investigation and based on Exova's report.

So really, no Eng sign offs are required. In my opinion, QC can inspect per D4010 Rev. C.

Marc Bellavance**Mechanical Designer/Technical Support*****DART aerospace Ltd.***

Tel: 613-632-5200 Ext. 240

Fax: 613-632-9311

E-mail: mbellavance@dartaero.comWeb: www.dartaero.com

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From: L Lacelle [mailto:llacelle@dartaero.com]**Sent:** June 3, 2010 7:27 AM**To:** 'Mike Petsche'; 'Marc Bellavance'**Subject:** 407 beapaws

We have had some 407 bearpawa D4010-041's made by Daryl some time ago that are still sitting near the pkging area waiting for engineering sign off...who can take care of this for me?

Thank You,

Linda Lacelle

Production Manager

Dart Aerospace Ltd

REFERENCE ONLY

6/03/10